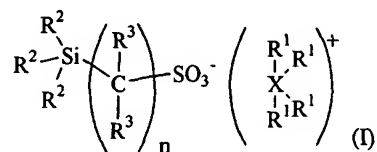


Claims

- [c1] 1. A quaternary onium organosilicon compound having the formula (I):



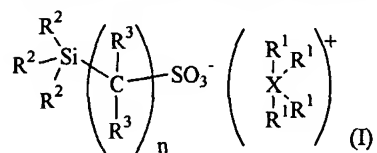
wherein each R^1 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; X comprises phosphorus or nitrogen;

each R^2 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; each R^3 independently comprises a substituted or unsubstituted, aliphatic functional group, substituted or unsubstituted, aromatic functional group or a hydrogen; and "n" has a value of about 1 to about 20.

- [c2] 2. The compound of Claim 1, wherein each R^1 is an n-butyl radical, X is phosphorus or nitrogen, each R^2 is a methyl radical, each R^3 is a hydrogen, and "n" has a value of about 2 to about 10.

- [c3] 3. The composition of Claim 1, wherein each R^1 is an n-butyl radical, X is phosphorus or nitrogen, each R^2 is a methyl radical, each R^3 is a hydrogen, and "n" has a value of about 3.

- [c4] 4. A polymer composition comprising a polymer and a quaternary onium organosilicon compound having the formula (I):



wherein each R^1 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; X comprises phosphorus or nitrogen;

each R^2 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; each R^3 independently comprises a substituted or unsubstituted, aliphatic functional group, substituted or unsubstituted, aromatic functional group or a hydrogen; and "n" has a value of about 1 to about 20.

- [c5] 5. The composition of Claim 4, wherein the organosilicon compound is present

in an amount of about 2.5×10^{-3} parts to about 6 parts per 100 parts of the polymer.

[c6] 6.The composition of Claim 4, wherein the organosilicon compound is present in an amount of about 3×10^{-2} parts to about 6 parts per 100 parts of the polymer.

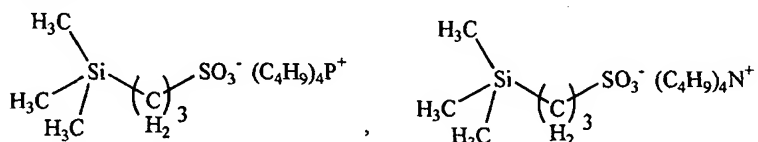
[c7] 7.The composition of Claim 4, wherein the organosilicon compound is present in an amount of about 0.3 parts to about 6 parts per 100 parts of the polymer.

[c8] 8.The composition of Claim 4, wherein the polymer comprises at least one condensation or addition polymer.

[c9] 9.The composition of Claim 8, wherein said polymer comprises at least one aromatic polycarbonate, polyestercarbonate, polyphenylene sulfide, polyetherimide, polyester, polyphenylene ether, polyphenylene ether/styrene polymer blends, polyamide, polyketone, acrylonitrile-butadiene-styrene copolymer, styrene-acrylonitrile copolymer, polyolefin, blends thereof, or blends thereof with other materials.

[c10] 10.The composition of Claim 9, wherein the polycarbonate and polyestercarbonate are obtained from polymerization processes comprising melt transesterification, interfacial polymerization, solid state polymerization, solution, redistribution processes, or combinations thereof.

[c11] 11.The composition of Claim 10, wherein the organosilicon compound comprises

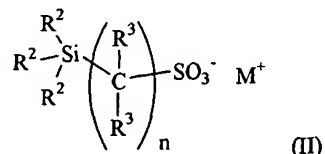


or mixtures thereof.

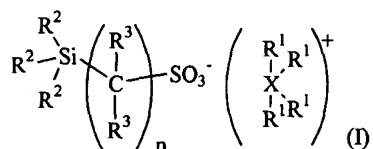
[c12] 12.An antistatic article comprising the polymer composition of Claim 11.

[c13] 13.The article of Claim 12, wherein the article comprises forward lighting assemblies, automotive headlamp lenses, fog lamp lenses, ophthalmic devices, conveyor belt systems, printer devices, and display panel devices for appliances.

- [c14] 14.A method of making aquaternary onium organosilicon compound comprising:
contacting a solution comprising a first solvent and an organosilicon monosulfonic acid salt having the formula



wherein M is an alkali metal, each R^2 is independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; each R^3 independently comprises a substituted or unsubstituted aliphatic functional group, a substituted or unsubstituted aromatic functional group or a hydrogen; and n is an integer having a value of about 1 to about 20 with an acidic medium to generate the corresponding free sulfonic acid composition,
contacting the free sulfonic acid composition with a quaternary compound to form a neutralization mixture,
extracting the neutralization mixture with a second solvent to provide an extractant; and
evaporating substantially all the solvent from the extractant to isolate a quaternary onium organosilicon compound having the formula (I):



wherein each R^1 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; X comprises phosphorus or nitrogen;
each R^2 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; each R^3 independently comprises a substituted or unsubstituted, aliphatic functional group, substituted or unsubstituted, aromatic functional group or a hydrogen; and "n" has a value of about 1 to about 20.

- [c15] 15.The method of Claim 14, wherein the alkali metal comprises lithium, sodium, potassium, rubidium, or cesium.

- [c16] 16.The method of Claim 14, wherein the free sulfonic acid composition is

contacted with the quaternary compound at a temperature of about 10°C to about 50°C .

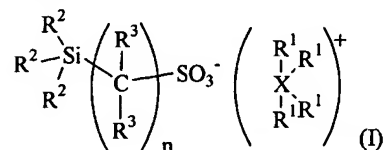
- [c17] 17.The method of Claim 14, wherein the free sulfonic acid composition is contacted with the quaternary compound at a temperature of about 20°C to about 30°C .
- [c18] 18.The method of Claim 14, wherein the acidic medium comprises a strong mineral acid, a polymeric acidic ion exchange resins or a combination thereof.
- [c19] 19.The method of Claim 18, wherein the acid medium is a polymeric acidic ion exchange resin bearing sulfonic acid groups.
- [c20] 20.The method of Claim 14, wherein the quaternary compound comprises $\text{X}(\text{R}^1)_4-\text{Y}$, wherein X comprises nitrogen or phosphorus; each R^1 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; and Y comprises hydroxide, OCOR^4 , and OR^4 , wherein R^4 comprises a substituted or unsubstituted, aliphatic or aromatic functional group.
- [c21] 21.The method of Claim 20, wherein X is phosphorus or nitrogen, R^1 is n-butyl, and Y is hydroxide.
- [c22] 22.The method of Claim 20, wherein the quaternary compound comprises tetraethylphosphonium hydroxide, tetra-n-butylphosphonium hydroxide, tetra-n-octylphosphonium hydroxide, or tetraphenylphosphonium hydroxide.
- [c23] 23.The method of Claim 14, wherein the pH of the neutralization mixture is about 4 to about 6.
- [c24] 24.The method of Claim 14, wherein the pH of the neutralization mixture is about 5 to about 5.5.
- [c25] 25.The method of Claim 14, wherein the first solvent comprises water, C_1-C_4 aliphatic alcohols, tetrahydrofuran, acetonitrile, C_7-C_9 aromatic hydrocarbons, or mixtures thereof.
- [c26] 26.The method of Claim 16, wherein the quaternary onium organosilicon compound is tetra-n-butylammonium 3-trimethylsilylpropanesulfonate, tetra-

n-butylphosphonium 3-trimethylsilylpropanesulfonate, or mixtures thereof

- [c27] 27.A method of making tetra-n-butylphosphonium 3-trimethylsilylpropanesulfonate comprising:
- contacting a solution comprising a first solvent and sodium 3-trimethylsilylpropanesulfonate with an acidic ion exchange resin to generate a solution of free 3-trimethylsilylpropanesulfonic acid;
- contacting the solution of free 3-trimethylsilylpropanesulfonic acid with tetra-n-butylphosphonium hydroxide to form a mixture having a pH of about 5.0 to about 5.5;
- extracting the mixture with a second solvent to form an extractant comprising tetra-n-butylphosphonium 3-trimethylsilylpropanesulfonate; and
- evaporating substantially all of the solvent from the extractant to isolate tetra-n-butylphosphonium 3-trimethylsilylpropanesulfonate.
- [c28] 28.The method of Claim 27, wherein said first solvent comprises water, C₁ - C₄ aliphatic alcohols, tetrahydrofuran, acetonitrile, C₇ - C₉ aromatic hydrocarbons, or mixtures thereof.
- [c29] 29.The method of Claim 27, wherein the second solvent comprises halogenated aliphatic and aromatic compounds, aliphatic and aromatic hydrocarbons, cyclic and acyclic ethers, or mixtures thereof.
- [c30] 30.A method of making an antistatic thermoplastic polymer composition comprising:
- combining a quaternary onium organosilicon compound with a thermoplastic resin in melt, wherein the organosilicon compound is represented by the formula:
- $$\begin{array}{c} \text{R}^2 \\ \diagup \\ \text{Si} \\ \diagdown \\ \text{R}^2 \end{array} \begin{array}{c} \text{R}^3 \\ | \\ \text{C} \\ | \\ \text{R}^3 \end{array} \text{SO}_3^- \left(\begin{array}{c} \text{R}^1 \\ | \\ \text{X} \\ | \\ \text{R}^1 \end{array} \right)^+ \quad (I)$$
- wherein each R¹ independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; X comprises phosphorus or nitrogen;
- each R² independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; each R³ independently comprises a substituted or

unsubstituted, aliphatic functional group, substituted or unsubstituted, aromatic functional group or a hydrogen; and "n" has a value of about 1 to about 20.

- [c31] 31. A method of making an antistatic thermoplastic polymer composition comprising:
dry-blending a thermoplastic polymer with a quaternary onium organosilicon compound, wherein the organosilicon compound is represented by the formula:



wherein each R^1 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; X comprises phosphorus or nitrogen;
each R^2 independently comprises a substituted or unsubstituted, aliphatic or aromatic functional group; each R^3 independently comprises a substituted or unsubstituted, aliphatic functional group, substituted or unsubstituted, aromatic functional group or a hydrogen; and "n" has a value of about 1 to about 20.